Proceedings of the Iowa Academy of Science

Volume 87 | Number Article 8

1980

Notes on the Mammals and Reptiles Inhabiting a Pinyon-Juniper Woodland in Western Nevada

Jeffrey B. Llewellyn
University of Nevada

Proc. Iowa Acad. Sci. 87(1):36-38. 1980

Notes on the Mammals and Reptiles Inhabiting a Pinyon-Juniper Woodland in Western Nevada

JEFFREY B. LLEWELLYN[1]

Department of Biology, University of Nevada
Reno, Nevada 89557

During a 33-month field study of *Peromyscus maniculatus* (Deer Mouse) and *Peromyscus truei* (Pinyon Mouse), 8 species of small mammals were captured, and 6 species of reptiles and 10 additional species of mammals were also recorded. Data is presented for habitat selection and relative density of the small mammals, and for the status (common, uncommon, rare) of the reptiles and additional mammals.
INDEX DESCRIPTORS: Mammals, reptiles, pinyon-juniper woodland, western Nevada.

From October 1974 to June 1977, over 300 days were spent in a pinyon-juniper woodland in western Nevada studying sympatric populations of *Peromyscus maniculatus* and *Peromyscus truei* (see Llewellyn, 1977). During the period 18 species of mammals and 6 species of reptiles were either captured, or observed directly or indirectly. Since little is known of the mammals and reptiles in the area and because the area is being gradually developed as Reno and Carson City grow and expand, I would like to make the observations recorded during this period available to others.

MATERIALS AND METHODS

Field studies (live trapping, habitat analysis, collection of feces for food analysis, etc.) were conducted in the Geiger Grade portion of the Virginia Range, which is located about 18 km SE of Reno and 10 km NW of Virginia City, Story Co., Nevada. The Geiger Grade ranges in elevation from 1465 to 2135 m, and consists of a woodland community dominated by singleleaf pinyon (*Pinus monophylla*) and Utah juniper (*Juniperus osteosperma*). Between the trees and in the larger open areas a total of 15 to 20 species of shrubs are found. The most common of these include low sagebrush (*Artemisia arbuscula*), snakeweed (*Gutierrezia sarothrae*), Mormon tea (*Ephedra viridis*), bitterbrush (*Purshia tridentata*), and big sagebrush (*Artemisia tridentata*). Boulder piles and talus rock slides are common on the mountain tops and slopes, and the soil is shallow and poorly developed. The climate exhibits a dry summer-wet winter pattern with a large portion of the precipitation in the form of snow, the average amount of precipitation per year is 370 mm, and the average monthly temperatures for January and July (1966-1976) were 0.3° C and 21.6° C (U.S. National Weather Service records, Virginia City station). Free water in the form of lakes, ponds, rivers, or streams is not available in the area (for a complete description of the area see Llewellyn, 1977).

The majority of the trapping was conducted on a permanent 1.4 ha study plot at an elevation of 2025 m. From 25 April 1975 to 21 October 1976, the plot was trapped for 3 successive nights on a biweekly basis using 140 Sherman live traps (22.8 × 7.6 × 7.6 cm) situated at 10 m intervals in a 140 × 100 m grid. Additional trapping was completed in the plot during August 1975, November and December 1976, and April and May 1977. During the 26 month period 134 trap periods and 19,030 trap nights were completed (for a detailed account of the trapping procedures see Llewellyn, 1977).

The traps, baited with dry rolled oats and provided with cotton for insulation during the colder months, were checked for captures in the early morning. All individuals captured were sexed, weighed, checked for reproductive condition, marked by toe-clipping, and released at the point of capture.

Forty-six additional trap periods, totalling 4505 trap nights, were also completed during October-December 1974 and June-September 1975 and 1976 throughout a 200 ha area (1520-2085 m) which included the 1.4 ha study plot. Within the 200 ha area 38 smaller areas (called localities) were randomly selected and sampled. A locality was normally trapped for 1 trap period using 100 Sherman live traps, but in a few instances a locality was trapped for 2 successive periods. The traps were set at 10 m intervals in the form of a grid or as lines depending on the physical contour of the locality. Animals captured were sexed, weighed, checked for reproductive condition, and released at the point of capture (except for 37 *P. maniculatus* and 40 *P. truei* that were removed and used in laboratory studies).

RESULTS AND DISCUSSION

During the trapping period 8 species of small mammals were captured (Table 1). In addition to this list, *Peromyscus crinitus* (Rock Mouse) and *Sorex merriami* (Merriam's Shrew) should also be included. Panik (1976) collected 3 *P. crinitus* in the Geiger Grade, 1 in October 1974 and 2 in January 1975. A shrew observed by the author on 15 May 1977, in a large open area of low sagebrush and snakeweed, was probably *S. merriami* due to its size and coloration (Jackson, 1928; Hall, 1946; Hall and Kelson, 1959), and the type of habitat. Most specimens of *S. merriami* have been collected in open arid areas (Hall and Kelson, 1959), and of the 5 species of shrews found within an 80 km radius of Reno, 4 are restricted to moist areas whereas only *S. merriami* is found in drier sagebrush habitats (F.A. Ryser, pers. comm.).

Ten additional species of mammals were observed directly or indirectly (tracks, vocalizations, feces, etc.) during the 33-month period (Table 2). In addition to these species, tracks of *Felis concolor* (Mountain Lion) and a single *Lynx rufus* (Bobcat) were observed by Panik (1976), and a skin of *Urocyon cinereoargenteus* (Gray Fox), collected in the Geiger Grade area by W.H. Brookerd, is in the permanent collection of the University of Nevada, Reno, Biological Sciences Museum.

Although only a single *S. beecheyi* was captured, probably because of their large size in comparison with the Sherman live trap, they were often seen in rocky areas or beside Nevada highway 17 which passes through the Geiger Grade area. *S. merriami* possibly was not captured because they were not heavy enough to trip the trap. *S. merriami* has never been found in abundance and only 3 specimens are known from Nevada (Diersing and Hoffmeister, 1977). *A. leucurus, N. cinerea,* and *L. curtatus* were not found in higher numbers probably because only small amounts of their optimun habitats were available in the Geiger Grade area. *A. leucurus* is usually found in lower desert

[1]Present address: Science Division, College of Basic Studies, Boston University, 871 Commonwealth Avenue, Boston, MA 02215.

environments (Deacon et al., 1964; Hall and Kelson, 1959); *N. cinerea* is a boreal species and is found mainly at higher elevations or latitudes (Deacon et al., 1964; Hall and Kelson, 1959); and *L. curtatus* apparently requires suitable sagebrush habitats (O'Farrell, 1972). The single *A. leucurus* was captured in an open area of low sagebrush and snakeweed at an elevation of 2025 m; the 2 *N. cinerea* were found in separate boulder piles about 1.4 km apart, at elevations of 2010 and 2085 m; and the single *L. curtatus* was captured in a small pocket of big sagebrush and a few bitterbrush at an elevation of 1890 m.

P. maniculatus was found in all areas and microhabitats throughout the 200 ha area, whereas *P. truei* was mainly limited to trees and/or boulder piles or talus rock slides (for a quantitative analysis of habitat selection by these 2 species see Llewellyn, 1977). *N. lepida* was usually captured in boulder piles with or without tree cover, or in the woodland at distances up to 25 m from a boulder pile. None of the typical "woodrat houses" or nests of sticks and other materials were found. Apparently the house-building instinct is poorly developed in *N. lepida,* in comparison with other species of woodrats (Hall, 1946), and some *N. lepida* do not construct houses (Bonaccorso and Brown, 1972). *E. minimus* was found in most areas and microhabitats, but they preferred those localities which provided the most cover such as trees associated with rocks, or stands of bitterbrush and/or big sagebrush. In these localities populations were often high (4-8 individuals captured) when compared with other localities sampled. Sagebrush possibly is not a requirement for the presence of *E. minimus* in the Geiger Grade area, as it apparently is in other areas of Nevada (Hall, 1946; Brussard, 1966).

The species of reptiles recorded during the 33-month period are

Table 1. *Small mammals captured in a pinyon-juniper woodland in western Nevada from October 1974 to May 1977.*

Species	Common Name	Total Captures	Percent of Total Captures
Eutamias minimus	Least Chipmunk	35 (6)*	2.45
Ammospermophilus leucurus	Antelope Ground Squirrel	1 (1)	0.07
Spermophilus beecheyi	California Ground Squirrel	1 (0)	0.07
Peromyscus maniculatus	Deer Mouse	794 (608)	55.60
Peromyscus truei	Pinyon Mouse	523 (403)	36.62
Neotoma lepida	Desert Woodrat	71 (39)	4.97
Neotoma cinerea	Bushy-tailed Woodrat	2 (0)	0.14
Lagurus curtatus	Sagebrush Vole	1 (0)	0.07
TOTAL		1428 (1057)	99.99

*Numbers in parentheses represent captures in the permanent 1.4 ha study plot.

Table 2. *Mammals observed in a pinyon-juniper woodland in western Nevada from October 1974 to June 1977.*

Species	Common Name	Status*
Sorex merriami	Merriam's Shrew	Rare
Sylvilagus nuttallii	Nuttall's Cottontail	Uncommon
Lepus californicus	Black-tailed Jack Rabbit	Common
Eutamias minimus	Least Chipmunk	Common
Spermophilus beecheyi	California Ground Squirrel	Common
Thomomys talpoides	Northern Pocket Gopher	Common
Erethizon dorsatum	Porcupine	Uncommon
Canis latrans	Coyote	Common
Vulpes vulpes	Red Fox	Rare
Spilogale gracilis	Western Spotted Skunk	Uncommon
Equus caballus	Wild Horse	Common
Odocoileus hemionus	Mule Deer	Uncommon

*Based on the number of observations: 1 sighting — Rare; 2-5 sightings — Uncommon; 6+ sightings — Common.

Table 3. *Reptiles recorded in a pinyon-juniper woodland in western Nevada from October 1974 to June 1977.*

Species	Common Name	Status*
Sceloporus occidentalis biseriatus	Great Basin Fence Lizard	Common
Phrynosoma platyrhinos platyrhinos	Northern Desert Horned Lizard	Rare
Cnmidophorus tigris tigris	Great Basin Whiptail Lizard	Rare
Charina bottae utahensis	Rocky Mountain Rubber Boa	Uncommon
Masticophis taeniatus taeniatus	Desert Striped Whipsnake	Uncommon
Pituophis melanoleucus deserticola	Great Basin Gopher Snake	Common

*Based on the number of observations: 1 sighting — Rare; 2-5 sightings — Uncommon; 6+ sightings — Common.

shown in Table 3. The most common reptile observed was *S. occidentalis,* over 50 individuals were counted. They were most common in rocky habitats, but occasionally they were seen beneath pinyon and juniper trees. When approached they often performed "push-up" movements, and many adults were missing portions of their tail in late summer. One *P. platyrhinos* was found beneath a big sagebrush in the ecotone between the lower sagebrush desert and the woodland, at an elevation of 1465 m, and 1 *C. tigris* was captured in a Sherman live trap, located along a dry stream bed at an elevation of 1555 m. Four *C. bottae* were counted at higher elevations (1980-2075 m). Three were seen in cooler and moister habitats beneath pinyon trees, while the fourth was observed in the early morning crossing an open area of low sagebrush and snakeweed. Four *M. taeniatus* were also found at higher elevations (1980-2075 m). One was observed beneath a stand of pinyon trees, 2 in pinyons associated with rocks, and the fourth in an open area of low sagebrush and snakeweed. All 4 moved very rapidly when disturbed and 1 individual climbed into and through a pinyon tree. Eight *P. melanoleucus* were found at most elevations in the 200 ha area. Six were road kills on Nevada highway 17, and 2 individuals were seen in open areas of low sagebrush and snakeweed.

In comparison with these findings, Panik (1976) surveyed the reptiles in a 10.5 ha area (adjacent to the 200 ha area, 1610 m elevation) in the Geiger Grade during the summer 1974, and recorded *S. occidentalis,* which was common, and a single *M. taeniatus* (this individual also climbed into and through a pinyon tree).

ACKNOWLEDGEMENTS

I would like to thank Drs. Stephen Jenkins and Karen Loehr, University of Nevada, Reno, for reading an earlier draft of the manuscript, and Mr. Paul Lazaris, Lake Tahoe Recreational Land Co. Inc., for permission to use the area on which the permanent study plot was located. Financial support was received from the Department of Biology, University of Nevada, Reno, and from a Merchant Scholarship awarded by the University of Northern Iowa, Cedar Falls.

REFERENCES

BONACCORSO, F.J., and J.A. BROWN. 1972. House construction of the desert woodrat, *Neotoma lepida lepida. J. Mammal. 53:* 283-288.

BRUSSARD, P.F. 1966. Distribution and occurrence of small mammals in the middle altitudes of the Carson Range, Nevada. M.S. Thesis, Univ. Nevada, Reno. 74 pp.

DEACON, J.E., W.G. BRADLEY, and K.M. LARSEN. 1964. Ecological distribution of mammals of Clark Canyon, Charleston Mountains, Nevada. *J. Mammal. 45:* 397-409.

DIERSING, V.E., and D.F. HOFFMEISTER. 1977. Revision of the shrews *Sorex merriami* and a description of a new species of the subgenus *Sorex. J. Mammal. 58:* 321-333.

HALL, E.R. 1946. Mammals of Nevada. Univ. California Press, Berkeley. 710 pp.

_____, and K.R. KELSON. 1959. The mammals of North America. The Ronald Press Co., New York. 2 vol., 1162 pp.

JACKSON, H.T. 1928. A taxonomic review of the American long-tailed shrews. *N. Amer. Fauna. 51:* 1-238.

LLEWELLYN, J.B. 1977. Competition and coexistence in sympatric populations of *Peromyscus maniculatus* and *Peromyscus truei.* Ph.D. Dissert., Univ. Nevada, Reno. 118 pp.

O'FARRELL, T.P. 1972. Ecological distribution of sagebrush voles, *Lagurus curtatus,* in south-central Washington. *J. Mammal. 53:* 632-636.

PANIK, H.R. 1976. The vertebrate structure of a pinyon-juniper woodland community in northwest Nevada. Ph.D. Dissert., Univ. Nevada, Reno. 319 pp.